# Syllabus, PHYS 101, Fall 2016

**Instructors**

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If you have any questions or comments about the course, the grading, the problems, or the physics, we would like to hear from you. You will be welcome most of the time if you show up in our offices, and we will try to accommodate you if you show up unannounced (but it makes sense to contact us in advance). Please feel free to send an email at any time – we will try to respond as quickly as possible.

**Learning Objectives**

Students will learn how the interactions between objects can be described by forces, how the changes resulting from those interactions can be determined using Newton's Laws of motion, and how these changes are constrained by conservation laws.

**Course Outline**

***Scalars and vectors***
***Motion in one dimension:*** displacement, velocity, acceleration, motion with constant acceleration, freely falling bodies
***Motion in two dimensions:*** projectile motion, circular motion, relative motion
***Newton's Laws of Motion:*** force, equilibrium, three laws of motion, inertial frames, free-body diagrams, friction, gravitation
***Work and energy:*** work, kinetic energy, work-energy theorem, conservative and non-conservative forces, potential energy, energy conservation, power
***Linear momentum and collisions:*** momentum and its conservation, complex bodies, center of mass, elastic and inelastic collisions, impulse-momentum theorem
***Rigid body rotation:*** angular velocity and acceleration, rotational kinetic energy and inertia, torque, dynamics of rotation
***Angular Momentum:*** conservation of angular momentum, translation and rotation
*Statics*
***Oscillatory motion:*** simple harmonic motion, systems that execute simple harmonic motion

**Announcements**
Announcements are made on the Physics 101 Owl-Space page under the "Announcements" tab and often e-mailed. You are responsible for checking for announcements.

**Weekly Class Meetings**
*Plenary course meetings (PHYS101)* will be held Monday and Wednesday at 9:00 am and 10:00 am in Herzstein Amphitheater. In these sections concepts will be explained and illustrated through lectures and demonstrations. While you must be enrolled in either PHYS101 Section 001 at 9:00 am or PHYS101 Section 002 at 10:00 am, you may attend either lecture.

*Small group discussions (PHYS103)* will be held either Thursday, or Friday according to your assigned section. In these sections the concepts will be discussed in more detail, and problem-solving strategies will be illustrated. To get credit for PHYS101, you must register for PHYS103 and choose a section that fits your schedule.

***To reiterate, you must be signed up for both PHYS101 and PHYS103. You must attend your assigned section of PHYS103.***

**Laboratory**
*The laboratory is an integral part of the course.* You must complete an online form to request a lab meeting time before 5 pm, Friday, August 26, 2016, in order for us to take into account your scheduling preferences. The online lab preference form can be found in the "Lab Preference Form" link under the PHYS 101 F16 tab in Owl-Space. You do not have to register separately with the university registrar for the lab. Performing the laboratory experiments is very important and missing a laboratory is a prescription for loss of credit. Laboratory policies are presented in more detail in the laboratory manual available on Owl-Space. *All questions related to the laboratories should be directed to Dr. Yu.*

**Textbook/WebAssign Access**
We are using a special edition of the textbook by Serway and Jewett: *Physics for Scientists and Engineers, Hybrid (with Enhanced WebAssign Homework and eBook LOE Printed Access Card for Multi Term Math and Science), 9th Edition, ISBN* **978-1305080362. Do not buy used versions of this textbook online as they are highly unlikely to include the necessary access code to the online homework system – WebAssign.** If you already have a version of the textbook it is possible to purchase the WebAssign access separately on their website.

While the textbook is available in the campus bookstore, it will be much cheaper to purchase it online from the publisher: You can go to
http://services.cengagebrain.com/course/site.html?id=1183321
to make your purchase. This is a special offer to Rice students.

**WebAssign Registration**
When registering with WebAssign use the Class Key: rice 2420 2634. Please fill in your Student ID when registering with WebAssign. This will help ensure you get proper credit for your work.

**OpenStax**
You are encouraged to use the free *University Physics* textbook available through OpenStax as a supplemental text for the course. The book is available in both e-text and PDF formats. The textbook is still in draft form at this time, but the material for Phys 101 is reasonably complete. You should check on updates from time to time.

e-text: http://cnx.org/contents/1Q9uMg_a@2.78:bG-_rWXy@5/Introduction
PDF: link provided in OwlSpace.

**Calculators and Symbolic Programs**
You should have a hand-held calculator for use in doing calculations in homework, pledged problems, and exams. It does not need to be programmable, but it should compute trigonometric and exponential functions. You may not use symbolic manipulation programs, calculators or websites to complete your homework, exams, or pledge problems.

**WebAssign Homework**
You will be assigned weekly homework in the WebAssign online homework system. These will provide experience in problem solving and in using the concepts discussed in the course. They are selected to help you prepare for the pledged problems and exams. You are encouraged to discuss these problems with fellow students, tutorial leaders, and instructors. You may attempt to answer each question up to 5 times. Note that students will get individualized versions of the problems (*i.e.*, the numbers in your version of the problem may be different from your classmates) so you will need to work out the final answers for yourself.

**Pledged Problems**
These problems will also be taken in WebAssign, but you must work them alone. Y**ou may consult your own notes, problem solutions we have posted, your own textbook (including the eBook version), and a calculator; all other resources are banned.** After the first attempt at a solution to a pledged problem, you will receive a penalty for each additional attempt. The pledged problems are timed and once you open the problem set you will have a predetermined amount of time to complete it. Once you have started the assignment, the timer does not stop, even if you close WebAssign. The actual due date for a pledged problem is either the date and time when the timer expires or the original assignment due date and time. For example, if you start a 10-minute pledged problem set 3 minutes before the due date and time, you will only have 3 minutes to complete it.

**Small Group Participation**
Attendance and participation will be evaluated in the small group sessions on Thursday and Friday. Participation grades for each PHYS 103 section will be normalized across all sections of PHYS 103. This will ensure that there are not final grade differences due to the grading patterns of any particular instructor.

**Tests and Final Examination**
90-minute tests will be given at dates and times to be determined. There will also be a three-hour COMPREHENSIVE FINAL EXAMINATION that will be ***scheduled by the registrar***. Non-programmed hand calculators may be used on tests and the final examination but no books or notes will be allowed. You may not use cell phones or tablets as calculators. Solutions to tests and the final examination will be posted to Owl-Space. Historically, the median class score on tests has ranged from about 55% to 70%. Typically, there is a review session a few days before the exam.

Grades on the free response section of exams are based on what you actually write down. Ordinarily, the answer to a problem by itself, even if correct, is not sufficient to obtain full credit; you must also show that your method of solution is correct. Proper physical reasoning, when clearly demonstrated, will earn significant amounts of partial credit, even in the face of grievous mathematical errors. *The grader should be able to determine, without guessing, the steps used to solve the problem.*

**Re-grading Policy**
Do not write in a graded exam book after it has been returned to you. If, after consulting the solutions we have prepared, you feel that your work was not correctly graded, please direct our attention to the specific issues by means of a note on a separate sheet stapled to your paper. *Submit it to your instructor within one week after the solutions were posted*. We will review the grading of the part to which you direct our attention, and possibly the rest of the paper to ensure that your grade is consistent with the instructions given to the graders, and re-determine the grade that the paper deserves.

**Make-ups and Excused Days**
Make-ups for missed pledged problems, tests, or laboratories will be given at the discretion of the instructor. You can be excused without penalty or be allowed a delayed make-up of pledged problems or tests if one of the following two conditions is met:

1. You are on official university business or you have a conflicting class, and you notify us well beforehand. If you have a conflicting class, a signed note from the instructor of that course is required stating that you actually attended class on the day of the test.

2. You have a serious reason beyond your control, such as your own illness or a death in your family, and you get word to us immediately. As soon as possible,

notify your instructor in writing or by e-mail. (The policy on laboratory make-ups is stated in the lab manual available on Owl-Space).

**Calculation of Semester Grade**
Your semester grade will be determined as follows:

Two tests ---------- 30%
Final Exam ----------20%
Pledged Problems ----------15%
WebAssign Homework----------10%
Laboratory ----------15%
Small Group Participation----------10%

Additionally **you must receive a final laboratory grade of 50% or above** in order to pass the course.

You should retain all your tests, pledged problems, graded laboratory reports, and the final exam so that you can confirm the accuracy of our records, which we will update regularly on Owl-Space. Students who receive a weighted average of 90% or greater will receive a grade of at least A-, while those obtaining a weighted average of 75% or greater will receive a grade of at least a B-, and those students who obtain averages of 60% or greater will receive a grade of at least C-. We may lower these cut-offs at the end of the semester, but we will not raise them.

**The Honor System**
We believe very strongly in the Rice Honor System: it applies to all work submitted for a grade in the course (except for suggested problems), and we perform our due diligence as instructors in upholding it. The Honor Pledge should be written in full and signed on the midterm tests and final examination, and it is implied for the pledged problems on WebAssign. Note:

1. Students will be seated in tests and exams in alternate seats, or as otherwise directed by the person administering the test or examination.

2. Test or examination papers will not be taken from the examination room without the permission of the person administering the test or examination. If you have a special problem with taking a test in the place to which you have been assigned, please let us know.

Numerous resources for solving physics problems are available via the Internet. These sites can be perfectly legitimate tools when seeking additional examples to learn difficult concepts, but none of them are permitted for use on pledged assignments, such as pledged problems and tests. We are aware of many of these sites and maintain user profiles on them that allow us to check for PHYS 101 course content appearing thereon.

**Students with Disabilities**

Any student with a documented disability seeking academic adjustments or accommodations is requested to speak with the instructors during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities are encouraged to also contact Disability Support Services in the Allen Center (e-mail: adarice@rice.edu, phone: 713-348-5841) during the first two weeks of class so that timely and appropriate arrangements may be made.